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South Florida microfungi: *Kalamarospora multiflagellata* gen. et sp. nov. (hyphomycetes), with additional new records from USA

Gregorio Delgado

gdelgado@emlabpk.com
EMLab P&K, Southeastern Regional Laboratory
6301 NW 5th Way Suite 2850, Fort Lauderdale, FL 33309, USA

Abstract—*Kalamarospora multiflagellata* anam. gen. et sp. nov. is described and illustrated from rachides of dead leaves of *Sabal palmetto* collected in southwestern Florida, USA. The genus is characterized by having obclavate to ellipsoidal conidia internally filled with a mass of subhyaline, septate, 2–3 µm wide filaments growing upward from suprabasal cells at the bottom of the conidia and protruding apically or subapically as long, filiform, subhyaline or hyaline, sometimes 1–2 times dichotomously branched appendages. Conidia are borne on monoblastic, transversely striate, percurrently proliferating conidiogenous cells disposed on macronematous, cylindrical, solitary, unbranched, dark brown to blackish brown conidiophores. The conidial secession is rhexolytic, leaving a distinct, usually truncate frill up to 7 µm long, which remains attached to the basal cell of the conidia. *Kalamarospora* is compared with anamorphic genera and species having a similar internal conidial organization or morphologically close taxa with appendiculate conidia. *Ellisembia britannica*, *Polytretophora calcarata*, *Pseudoacrodictys corniculata*, *Sporidesmiella sinensis,* and *Triposporium verruculosum* are newly recorded from USA.

Key words—*Ceratosporella, Megacapitula,* palm fungi, *Piricaudilium*

Introduction

During a short visit to southwestern Florida, specifically the city of Naples and surrounding areas, some plant debris was collected in order to study the associated saprobic hyphomycetes (anamorphic fungi). A conspicuous and apparently undescribed anamorph was found growing on rachides of dead leaves of *Sabal palmetto*. The fungus shows close similarities to the monotypic genus *Megacapitula* J.L. Chen & Tzean (Chen & Tzean 1993) in conidial morphology and the presence of multiple apical, filiform appendages. Upon closer examination, however, the conidia revealed a peculiar internal

structure originating the appendages in combination with other features such as macronematous conidiophores, percurrent proliferating conidiogenous cells and a rhexolytic conidial secession. These features are significantly different from *Megacapitula* as presently conceived, and to my knowledge the combination of characters exhibited by the present fungus is distinct enough from all other previously known anamorphic genera to warrant the proposal of a new genus to accommodate it. *Kalamarospora* is therefore introduced, and a new species *K. multiflagellata* is described and illustrated herein. The type specimen and semi-permanent slides are deposited in the Herbarium of the U.S. National Fungus Collections (BPI). Five other hyphomycete species are recorded for the first time from USA, including comments on their taxonomy, morphology, and geographical distribution.

Taxonomy

Kalamarospora G. Delgado, **anam. gen. nov.**

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Ad fungus anamorphicos, hyphomycetes, pertinens. Coloniae in substrato naturali effusae, pilosae. Mycelium plerumque in substrato immersum, ex hyphis ramosis, septatis, laevibus, pallide brunneis vel brunneis compositum. Stromata absentia. Conidiophora macronematosa, mononematosa, singula vel aggregata, simplicia, erecta, recta vel leviter flexuosa, plerumque transversaliter striata, cylindrica, septata, atrobrunnea vel nigro-brunnea, percurrenter proliferentia. Cellulae conidiogenae monoblasticae, in conidiophoris incorporatae, terminales, cylindricae, pallide brunneae vel brunneae, transversaliter striatae, percurrentes. Conidiorum secessio rhexolytica. Conidia acrogena, solitaria, obclavata vel ellipsoidea, pallide brunnea vel brunnea, laevia, massa interna hypharum subhyalinarum, septatarum impleta, hyphis compluribus sursum protrudentibus velut appendicibus filiformibus, subhyalinis vel hyalinis, nonnumquam dichotomis. Teleomorphosis ignota.

Species typica—*Kalamarospora multiflagellata* G. Delgado

Etymology—Greek, καλαμάρι, squid and σπόρος, seed, in reference to the squid-like shape of the conidia.

Anamorphic fungi, hyphomycetes. Colonies on natural substratum effuse, hairy. Mycelium predominantly immersed in the substrate, composed of branched, septate, smooth, pale brown to brown hyphae. Stromata none. Conidiophores macronematous, mononematous, single or in groups, simple, erect, straight or slightly flexuous, mostly transversally striate, cylindrical, septate, dark brown or blackish brown, regenerating percurrently. Conidiogenous cells monoblastic, integrated, terminal, cylindrical, light brown to brown, transversely striate, percurrent. Conidial secession rhexolytic. Conidia acrogenous, solitary, obclavate or ellipsoidal, light brown to brown, smooth, internally filled with a visible mass of subhyaline, septate filaments protruding apically or subapically as multiple long, filiform, subhyaline or hyaline, dichotomously branched appendages. Teleomorph unknown.

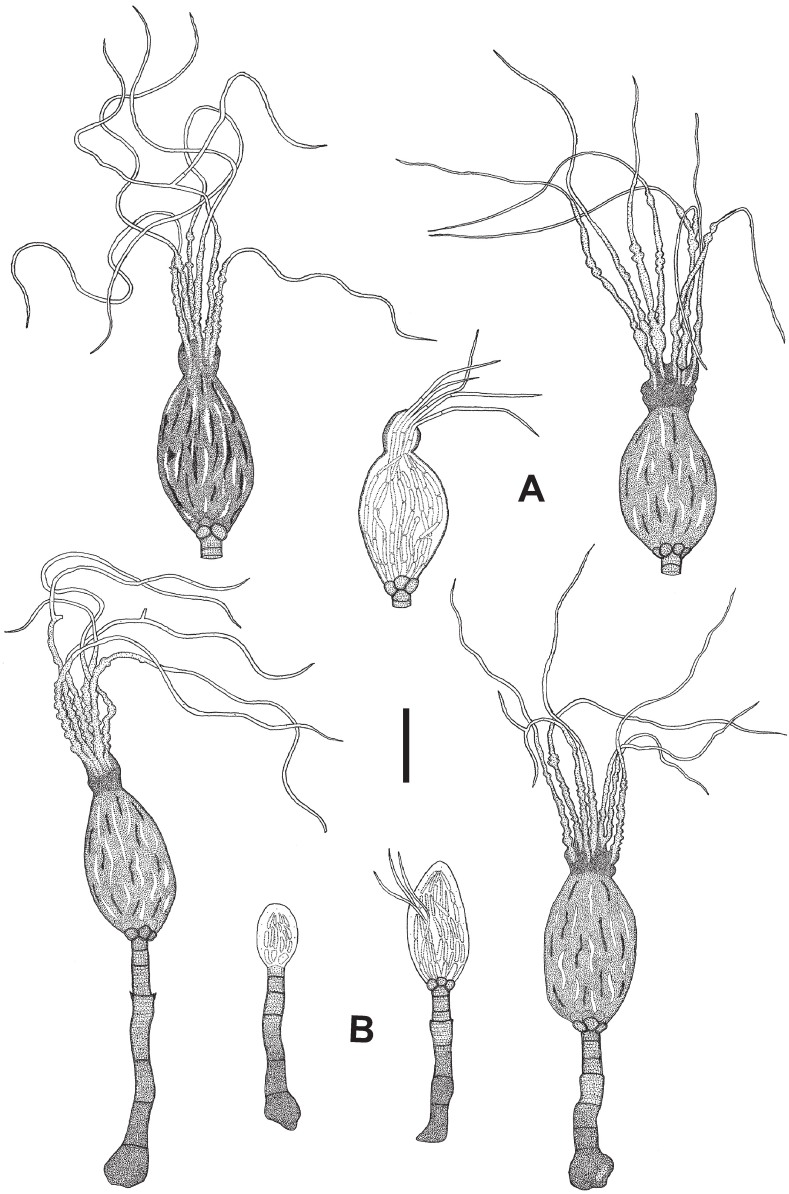


Fig. 1. *Kalamarospora multiflagellata*, from holotype (BPI 879811A).
A. Conidia. B. Conidiophores, conidiogenous cells and conidia.
The younger conidia show internal structure. Scale bar: 30 μm.

Kalamarospora multiflagellata G. Delgado, **anam. sp. nov.** Figs. 1–13

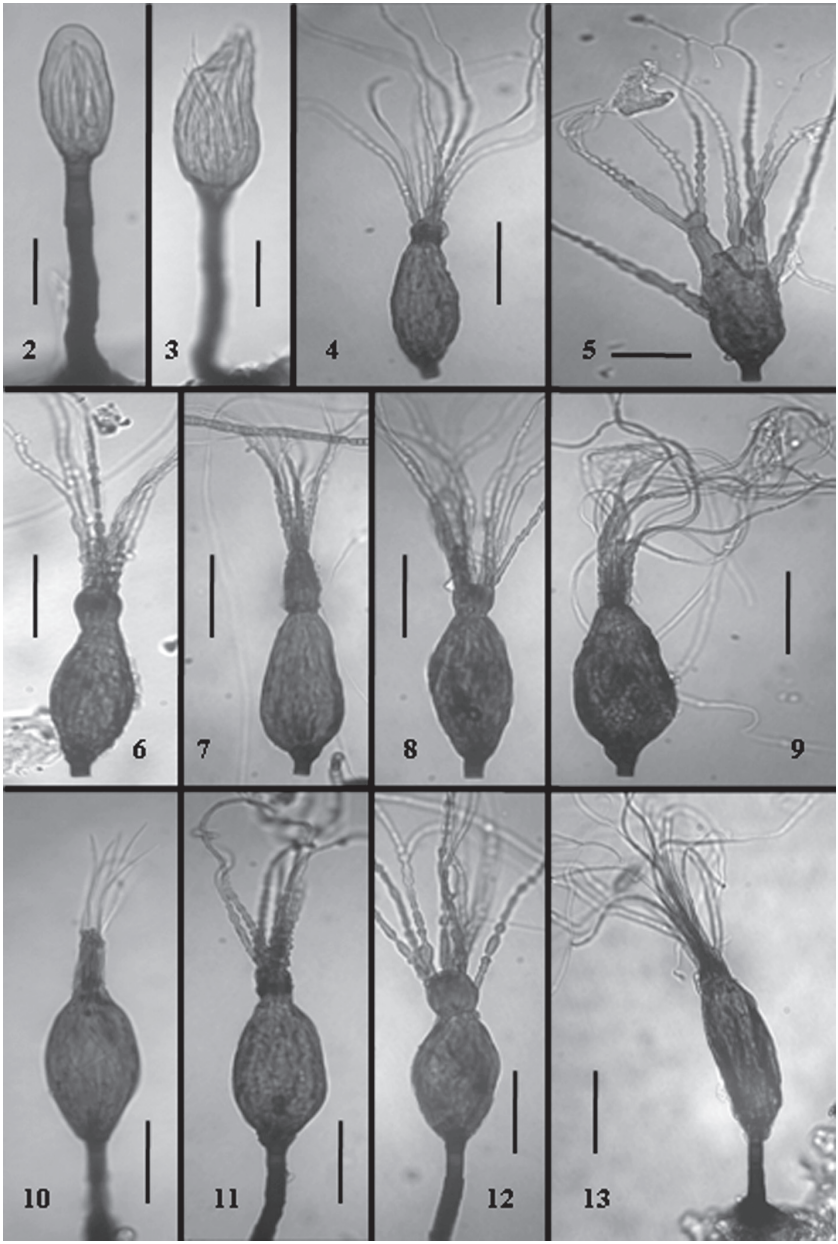
MycoBank MB518542

Coloniae in substrato naturali effusae, brunneae, pilosae. Mycelium plerumque in substrato immersum, ex hyphis ramosis, septatis, laevibus, pallide brunneis vel brunneis, 1–2.5 µm diam. compositum. Stromata absentia. Conidiophora macronemata, mononemata, singula vel 2–4 aggregata, simplicia, erecta, recta vel leviter flexuosa, transversaliter striata, irregulariter verruculosa vel laevia ad basim, crassitunicata, cylindrica, septata, atrobrunnea vel nigro-brunnea, usque ad 115 µm longa, 6–8 µm crassa, ad basim inflata, 7–15 µm crassa, semel ad quarter percurrenter proliferentia. Cellulae conidiogenae monoblasticae, in conidiophoris incorporatae, terminales, cylindricae, pallide brunneae vel brunneae, transversaliter striatae, percurrentes, ad apicem truncatae. Conidiorum secessio rhexolytica. Conidia acrogena, solitaria, obclavata vel ellipsoidea, pallide brunnea vel brunnea, tenuitunicata, laevia, 56–90 × 25–45 µm (appendice exclusa), e cellula basali, 4–6 cellulis suprabasalibus, coprore compacto fusiformi et usque ad 12 appendicibus apicalibus filiformibus composita; cellula basalis cylindrica, truncata, pallide brunnea vel brunnea, transversaliter striata, 5–8 × 5–7 µm, ad basim residuum conspicum praebens, usque 7 µm longa; cellulae suprabasales verticillatae, brunneae, laeves, 5–9 × 4–6 µm; corpus conidiale massa interna filamentorum subhyalinorum, septatorum, 2–3 µm latorum impleta, hyphis ascendentibus in summon conidio velut appendices filiformes, longae, septatae, subhyalinae vel hyalinae exeuntes, nonnumquam semel vel bis dichotomae; conidia usque ad 525 µm longa, corpus sursum attenuatum; in parte apicali saepe inflatum, atrum, tunica mucosa conspicua, pallide brunnea vel brunnea circumdatum. Teleomorphosis ignota.

Holotype—UNITED STATES. Florida: Collier Co., Naples, on rachides of dead leaves of *Sabal palmetto* (Walter) Lodd. ex Schult., (*Arecaceae*), XI.23.2007, coll. G. Delgado (BPI 879811A).

Etymology—Latin, *multiflagellata*, referring to the multiple filiform appendages of the conidia.

Anamorphic fungi, hyphomycetes. Colonies on natural substratum effuse, brown, hairy. Mycelium predominantly immersed in the substrate, composed of branched, septate, smooth-walled, pale brown to brown hyphae, 1–2.5 µm wide. Stromata none. Conidiophores macronematous, mononematous, single or sometimes aggregated in groups of 2–4, simple, erect, straight or slightly flexuous, transversely striate, irregularly verruculose or smooth toward the base, thick-walled, cylindrical, septate, dark brown or blackish brown, up to 115 µm long, 6–8 µm wide, 7–15 µm wide at the swollen base, with up to four successive, regenerative percurrent proliferations. Conidiogenous cells monoblastic, integrated, terminal, cylindrical, light brown to brown, transversely striate, percurrent, truncate at the apex. Conidial secession rhexolytic. Conidia acrogenous, solitary, obclavate or ellipsoidal, light brown to brown, thin-walled, smooth, often with wrinkled walls, 56–90 x 25–45 µm (excluding filaments), composed of a basal cell, 4–6 suprabasal cells, an ellipsoidal or obclavate main body, and up to 12 apical filiform appendages; basal cell cylindrical, truncate, light brown to brown, transversely striate, 5–8 x 5–7 µm, with a distinct, usually truncate, rarely irregular basal frill, up to 7 µm



Figs. 2–13. *Kalamarospora multiflagellata*, from holotype (BPI 879811A). 2–3. Young conidia showing incipient filaments. 4–9. Conidia. 10–13. Conidiophores, conidiogenous cells and conidia. Scale bars: 2–3 = 15 μm; 4–13 = 30 μm.

long; suprabasal cells disposed side by side around the upper part of the basal cell, brown, smooth, 5–9 x 4–6 µm; conidial body internally filled with a visible mass of subhyaline, septate, 2–3 µm wide filaments, growing upward from the inner portions of the suprabasal cells at the bottom of the conidia, elongating and protruding apically or subapically as divergent filiform, septate, subhyaline or hyaline, sometimes 1–2 times dichotomously branched appendages, up to 525 µm long, tapering to 1 µm at the apex; apical, protrusion region usually swollen, darker and surrounded by a light brown to brown, mucilaginous sheath extending to the proximal parts of the appendages. Teleomorph unknown.

Discussion

Kalamarospora is a genus of anamorphic, dematiaceous hyphomycetes with a unique combination of conidiogenesis, internal conidial organization and morphological features. The conidia are obclavate or ellipsoidal in shape, with thin, smooth, light brown to brown, often wrinkled walls, especially in well developed, older conidia, probably as a consequence of desiccation. They are internally filled with a visible mass of subhyaline, septate, 2–3 µm wide filaments, which arise from the inner parts of 4 to 6 brown suprabasal cells disposed side by side around the upper portion of a cylindrical, transversely striate, light brown to brown, truncate basal cell. The inner filaments grow upward, elongating and filling the inner space of the conidium, often with terminal cells slightly swollen and rounded. They protrude more or less synchronously through the conidial apex as a bundle of long, filiform, septate, subhyaline or hyaline, divergent, 1–2 times dichotomously branched appendages. The apical area around the protrusion is usually darker and surrounded by a light brown to brown, mucilaginous sheath, often giving a swollen appearance to the apex. Occasionally, the filaments also protrude subapically, not as a bundle but individually or in groups of 2–3 filaments. Once the filaments elongate outside the conidial wall, the mucilage extends and remains surrounding the proximal parts of the appendages, showing several discontinuities, gaps or bubbles once dry. The overall conidial morphology recalls the aspect of a minute squid, hence the name of the fungus *Kalamarospora*.

The conidia are born monoblastically on cylindrical, percurrent and transversely striate conidiogenous cells. This peculiar wall ornamentation is present also in the conidial basal cells and the upper conidiophore cells, and is apparently related with the rhexolytic break of the wall of the subtending cell of the conidium. A less pigmented, annular dehiscence zone is discernible below the basal cell delimiting septum. The transverse striations may serve as dehiscence lines where the circumscissile fracture of the lateral walls is more likely to evenly occur, usually a short distance below the basal cell delimiting septum and within the dehiscence zone. As a result, the conidiogenous cell

becomes empty and open-ended, and the detached conidium bears a cylindrical, truncate, and striate frill up to 7 µm long, which remains attached to the basal cell of the conidia. Conidiophore proliferation and subsequent conidiogenous cell delimitation occur then similarly as described for *Endophragmiella* B. Sutton (Holubová-Jechová 1986, Hughes 1979) and *Rhexoacrodictys* W.A. Baker & Morgan-Jones (Baker et al. 2002). Up to four successive, percurrent, and striate in appearance proliferations were seen in a single conidiophore, sometimes with a dark remnant of wall at the apex. However, after a percurrent proliferation emerges through the empty, non viable conidiogenous cell, two secondary septa are apparently laid down on the new proliferation, one delimiting the new conidiogenous cell and the other delimiting the basal cell of the next detached conidium. Baker et al. (2002) noticed a similar septation pattern following regenerative growth in *R. erecta*. Consequently, the conidium basal cell is more or less already established at the early stages of conidium development, showing already transversely striations. Two or three short, incipient filaments are recognizable within the conidium initial, sometimes with a very thin septum in one of them. Suprabasal cells likely originate from the lower cell of each of these incipient filaments.

Among the genera of anamorphic fungi hitherto known, the monotypic genus *Megacapitula* (Chen & Tzean 1993) closely resembles *Kalamarospora* in conidial morphology. *Megacapitula villosa* also possesses obclavate or ellipsoidal, pigmented conidia crowned with several densely packed, hairy, branched or unbranched, septate, apical appendages up to 556 µm long. The original description did not mention an existing internal structure originating the appendages, not even in early stages of conidial ontogeny, but the apical outer wall cracks open at a certain point of conidial development, apparently peeling-off easily, and the filiform appendages emerge from the conidial apex (Chen & Tzean 1993). Unfortunately, I was unable to examine the type material to confirm the presence of such an internal structure, probably present and overlooked as a result of the opaque, dark brown or black outer conidial wall. However, *Megacapitula* and *Kalamarospora* are not considered congeneric here because they differ in certain essential features. *Megacapitula* has micronematous or semi-macronematous, simple or branched, smooth, roughened, or verrucose conidiophores, with determinate, not percurrent, terminal but also lateral or occasionally intercalary conidiogenous cells. Conidia are muriform when mature, often with a reticulate wall when young, and secede schizolytically. The apical, long, filiform appendages present in both fungi, in addition to the mucilaginous sheath surrounding the conidial apex in *Kalamarospora*, are a rare combination of features among hyphomycetes. They are probably involved in the secure attachment of the conidia to the substrate after release and dispersal (Jones 2006).

The genus *Piricaudilium* Hol.-Jech. (Holubová-Jechová 1988) possesses an internal conidial organization more or less similar to *Kalamarospora*. They both share in common the presence of conidia with an internal mass of hyaline and septate filaments arising from the inner surface of the basal part of the conidia and filling their internal space once enlarging. The two genera, however, considerably differ in conidiophore, conidial morphology, and conidiogenesis. Conidiophores in *Piricaudilium* are micronematous or semi-macronematous, sometimes consisting only of monotretic, spherical or subspherical, terminal or intercalary conidiogenous cells, with an apical pore surrounded by a distinct dark scar. The conidia are turbinate or irregular in shape, ranging from obconical, spherical or subspherical to ovoid, finely rough, verrucose to spinulose around the base, with up to 10 pale brown, thick-walled, slightly flexuous or curved setiform appendages arising from distinct lobes and up to 120 μm long. The internal filaments are branched, apparently forming a network, and do not protrude outwards the conidial wall as in *Kalamarospora*, but instead end in short superficial appendages or fill the inner space of the longer setiform appendages. Holubová-Jechová (1988) noted that filaments in *Piricaudilium* were visible after long-term exposure to lactophenol cotton blue stain but were not colored in cotton blue. In *Kalamarospora*, however, filaments were mostly visible in younger, thinner-walled, developing conidia but also in older, even moderately wrinkled spores, which had been exposed to stain. Holubová-Jechová also considered these inner filaments were involved in the stabilization of the conidial morphology, which apparently occurs also in *Kalamarospora*, but stated that the filaments cells probably had a reproductive character as microconidia or were part of a synanamorph, which I was unable to verify in *Kalamarospora*. Future ultrastructural studies may be necessary to clarify the origin and role of these inner filaments in both fungi.

The propagules or sclerotia of the basidiomycetous anamorph *Akenomyces* G. Arnaud ex D. Hornby (Hornby 1984, Voglmayr & Krisai-Greilhuber 1997), with a complex internal and external structure, are also superficially comparable to *Kalamarospora*. They are dark brown, ellipsoidal-lenticular or obclavate among other shapes, with a tightly interwoven mass of internal, hyaline, thin-walled, much branched hyphae, 1.8–3.7 μm wide. The presence of hyphae bearing clamp-connections at the septa and its position within the *Basidiomycota*, however, clearly separates *Akenomyces* from *Kalamarospora*. Moreover, the sclerotia originate from sclerotial initials made up of tightly interwoven hyphae, and the walls are formed by a one-celled layer of dark, thick-walled, parallel hyphae interrupted by tubercles. They are loosely and externally enclosed by upwardly growing, curved or sinuate, hyaline hyphae densely incrusted with needle-shaped crystals. Although originally collected in a terrestrial environment, the complex sclerotial structure suggests an

adaptation of *Akenomyces* to the aero-aquatic niche (Voglmayr & Krisai-Greilhuber 1997).

Some species of *Ceratosporella* Höhn. with cheiroid conidia superficially resemble *Kalamarospora* in conidial morphology and conidiogenesis. This is one of the three types of conidial morphology currently recognized within the genus. The presence of two to sixteen branches or arms arising from a basal cell and more or less closely packed in a hand-shaped appearance characterized this group of species (Castañeda 1985, Castañeda et al. 1996b, Hughes 1952, 1971, Kuthubutheen & Nawawi 1991a, Lustrati 1980, Matsushima 1981, 1993, Sinclair et al. 1987, Wu & Zhuang, 2005, Zhang et al. 2009). *Ceratosporella disticha* Kuthub. & Nawawi, *C. compacta* R.F. Castañeda et al. and *C. flagellifera* Matsush. bear the most similarity to *K. multiflagellata*, particularly in having monoblastic, percurrent conidiogenesis and compact conidia with the apical cell of each arm forming a septate, slender appendage, surrounded by a mucilaginous sheath as in the case of *C. compacta*. They differ from *Kalamarospora*, however, in having branched conidia which schizolytically secede from the conidiogenous cells and lack an internal conidial structure.

Another group of species within the genus *Pseudoacrodictys* W.A. Baker & Morgan-Jones with appendiculate conidia (Baker & Morgan-Jones 2003, Somrithipol & Jones 2003) show also a slight resemblance with *Kalamarospora*. *Pseudoacrodictys appendiculata* (M.B. Ellis) W.A. Baker & Morgan-Jones, *P. corniculata*, *P. eickeri* (Morgan-Jones) W.A. Baker & Morgan-Jones, and *P. viridescens* (B. Sutton & Alcorn) W.A. Baker & Morgan-Jones possess conidia with a distinctly protuberant basal cell delimited by a transverse septum and somewhat hyphae-like, clustered or not, septate appendages. These appendages, however, are fewer in number and shorter in length compared with those in *Kalamarospora*, the longest reaching up to 56 µm long in *P. appendiculata.* They are not originated as a result of an internal conidial structure, and occasionally break or collapse at the thin-walled tip giving a truncate aspect. The conidia also differ in shape, ranging from subglobose to broadly pyriform, turbinate or somewhat irregularly shaped, secede schizolytically and bear numerous septa arranged in an oblique fashion. The cheiroid, ellipsoidal conidia of *P. dimorphospora* Somrith. & E.B.G. Jones (Somrithipol & Jones 2003) are reminiscent of those of *C. compacta* discussed above, and a reexamination of the type specimen might be necessary to confirm if they are conspecific.

The monotypic genus *Veracruzomyces* Mercado et al. (Mercado et al. 2002) also resembles *Kalamarospora* in having monoblastic, integrated, terminal, cylindrical, percurrent proliferating conidiogenous cells and obclavate, brown conidia similar in length, with a dark brown to black, cylindrical basal cell and a mucilaginous sheath at the apex. However, the conidia in *Veracruzomyces* are muriform, rostrate, with a paler, 1–4-septate beak, seceding schizolytically

with difficult, without apical filiform appendages or internal organization, and conidiophores often bear a lateral, pale brown, lageniform and septate protuberance which bend downwards.

Additional new records from USA

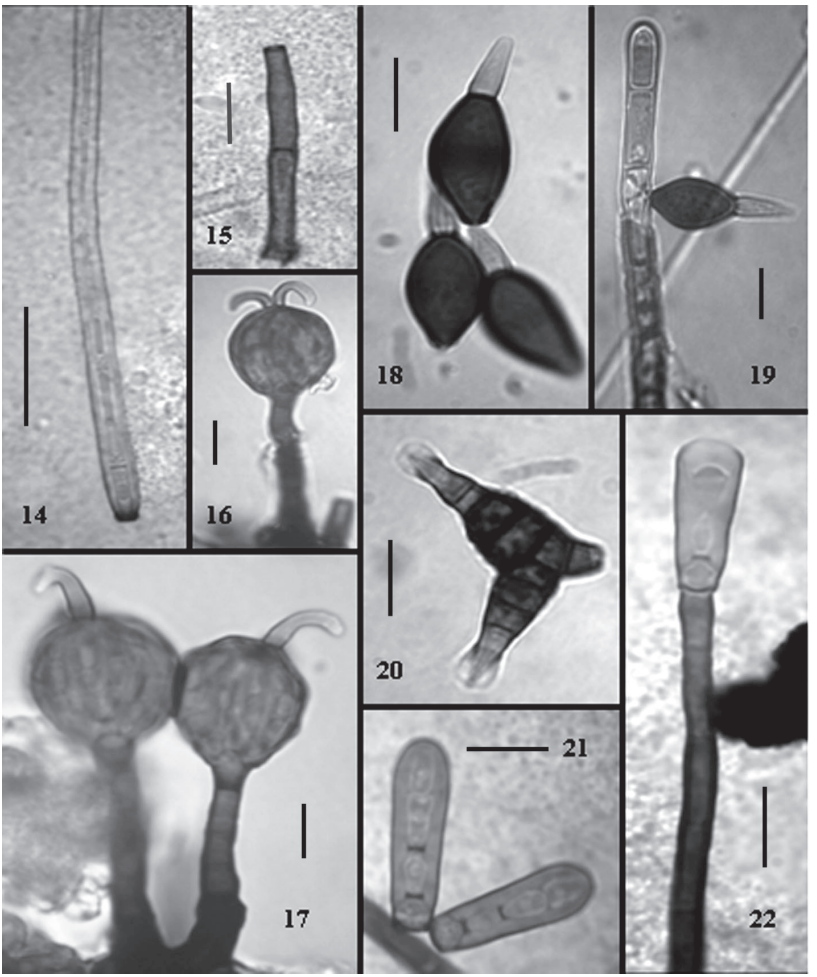
Ellisembia britannica (B. Sutton) W.P. Wu, in Wu & Zhuang, Fungal Diversity Research Series 15: 116, 2005. FIGS. 14–15

≡ *Sporidesmium britannicum* B. Sutton, in Minter, Bull. Br. mycol. Soc. 20: 87, 1986.

Colonies effuse, hairy. Conidiophores cylindrical or subcylindrical, straight or slightly flexuous, smooth, 1–3 septa, brown, 22–47 × 3–5 µm; base usually bulbous, 5–6 µm wide. Conidiogenous cells integrated, terminal, brown, apex occasionally darkened, 2–4 µm wide. Conidia narrowly obclavate, straight to curved, 5–18-distoseptate, subhyaline to pale brown, smooth, up to 350 µm long, 4.5–6 µm wide; basal cell conico-truncate, darkly pigmented, 2–2.5 µm wide at the base.

SPECIMEN EXAMINED: Florida, Collier Co., Naples, on rachides of dead leaves of *Sabal palmetto*, XI.23.2007, coll. G. Delgado (BPI 879811K).

This fungus was first described as *Sporidesmium britannicum* on a dead cupule of *Fagus sylvatica* L. from the United Kingdom (Minter 1986). Later, Wu & Zhuang (2005) collected four specimens on rotten wood and dead branches of woody plants in China, and transferred it to *Ellisembia* Subram. on the basis of its distoseptate conidia and conidiophores with irregular or without percurrent proliferations. According to the original description, conidiophores are 10–25 µm long, often proliferate percurrently, and no mention was made of dark pigmentation in the conidial basal cells. The Florida collection is closer to the Chinese specimens in conidial features and the presence of non-proliferating conidiophores. The conidia, however, are considerably longer compared to both the holotype (up to 57.5 µm long) and the Chinese specimens (up to 130 µm long). Ma et al. (2008) recently described two *Ellisembia* species from China that are morphologically similar to the present specimen of *E. britannica*. *E. artocarpi* Jian Ma & X.G. Zhang and *E. sapii* Jian Ma & X.G. Zhang are characterized by very long, obclavate to long rostrate, pale brown conidia, up to 220 µm and 240 µm long respectively. They both differ, however, in having wider conidia without a darkened basal cell, the latter with up to 23 distosepta. Another fungus, *Sporidesmajora pennsylvaniensis* Batzer & Crous collected on fruit surface of apple in USA (Yang et al. 2010), is also comparable with the Florida specimen in having very long, narrowly obclavate to long obclavate conidia up to 350 µm long, with darkly pigmented, obconical basal cells, but differs in its smooth to finely verruculose, guttulate and euseptate rather than distoseptate conidia.



Figs. 14–15. *Ellisembia britannica* (BPI 879811A). 14. Conidium. 15. Conidiophore. 16–17. *Pseudoacrodictys corniculata* (BPI 880521A). Conidiophores and conidia. 18–19. *Polytretophora calcarata* (BPI 880519A). 18. Conidia. 19. Conidiophore with attached conidium. 20. *Triposporium verruculosum* (BPI 880518B). Conidium. 21–22. *Sporidesmiella sinensis* (BPI 880520A). 21. Conidia. 22. Conidiophore with attached young conidium. Scale bars: 14 = 20 µm; 15–22 = 10 µm.

Polytretophora calcarata Mercado, Acta Bot. Cubana 16: 3, 1983. Figs. 18–19

≡ *Spadicoides calcarata* (Mercado) Melnik, Nov. sist. Niz. Rast. 28: 68, 1992.

=*Parahelminthosporium malabaricum* Subram. & Bhat, Kavaka 15: 63, 1989 ["1987"].

Colonies effuse, hairy, brown. Conidiophores erect, straight or flexuous, unbranched but sometimes sparingly branched, brown, paler towards the

apex, dark brown towards the base, up to 700 µm long, 5–7 µm wide in the upper part, 6–11 µm wide in the middle, 12–17 µm wide at the base, up to 2 regenerating percurrent proliferations. Conidiogenous cells polytretic, terminal or intercalary, cylindrical, rounded at the apex when terminal. Conidia 2-celled, 24–32 µm long; basal cell ellipsoidal to fusiform, brown, thick-walled, guttulate, often with a slightly darker band around the middle, 13–20 × 7–11 µm, truncate at base; apical cell subhyaline, conico-truncate, 8–13 µm long, 3–4 µm wide at the base, tapering to 2 µm at the apex.

Specimen examined: Florida, Collier Co., Naples, on segments of dead leaves of *Sabal palmetto*, XI.24.2007, coll. G. Delgado (BPI 880519A).

Polytretophora calcarata, the type species of the genus, is apparently pantropical in distribution. The fungus has been widely collected on *Arecaceae* and *Pandanaceae* in many tropical and subtropical Asian countries, Australia, and the Pacific Islands, as well as the Seychelles (Kuthubutheen & Nawawi 1991b, Whitton et al. 2001). In the Americas, it has been previously recorded several times from Cuba, the type locality (Mercado 1983, Hernández & Mena 1995, Mercado et al. 1997), on decaying palm petioles from Peru (Matsushima 1993) and now for the first time from the subtropical United States. The Florida specimen has occasionally branched, longer conidiophores compared with the holotype from Cuba (conidiophores simple, 150–350 µm long), but is similar in conidiophore length, branching, and conidial dimensions to other specimens cited in the literature. The presence of a darker band of pigmentation around the middle of the basal cells of the conidia was originally reported by Whitton et al. (2001) and was detected in the present specimen. Kuthubutheen & Nawawi (1991b) also reported a *Selenosporella* synanamorph in collections from Malaysia, but this feature was not observed.

Pseudoacrodictys corniculata (R.F. Castañeda) W.A. Baker & Morgan-Jones, Mycotaxon 85: 378, 2003. Figs. 16–17

≡ *Acrodictys corniculata* R.F. Castañeda, Deuteromycotina de Cuba, Hyphomycetes 2: 1, 1985.

Colonies effuse, hairy. Conidiophores solitary or in small groups, mostly unbranched or sparingly branched, cylindrical, straight or slightly flexuous, smooth, brown to dark brown, 23–52 × 3–5 µm, 6–8 µm wide at base, with 0–2 percurrent proliferations. Conidiogenous cells monoblastic, integrated, terminal, cylindrical, percurrent. Conidia subglobose to globose, rarely broadly pyriform, dictyoseptate, smooth, brown, 17–28 × 14–30 µm, with a distinct protuberant, conico-truncate basal cell, 3–6 × 4–6 µm, and 0–6 pale brown, horn-like, strongly curved, aseptate appendages, clustered or not, 6–19 x 2–4 µm. Conidial secession schizolytic.

Specimen examined: Florida, Collier Co., Naples, on rachides of dead leaves of *Sabal palmetto*, XI.23.2007, coll. G. Delgado (BPI 880521A).

Castañeda (1985) originally described this peculiar anamorph as *Acrodictys corniculata* from fallen leaves of unidentified *Poaceae* in Cuba. Later, Baker & Morgan-Jones (2003) partly reformatted and amended the original description to accommodate it, along with six other formerly placed *Acrodictys* species, within the narrowly delimited genus *Pseudoacrodictys*. *Pseudoacrodictys corniculata* is distinct by the presence of relatively small conidia, with short, horn-like, strongly curved appendages, often distally clustered at the apex. The present collection is the second record of its occurrence worldwide. The Florida specimen is similar to the holotype in dimensions and morphology, but sometimes the conidial appendages were not apically clustered but segregated and laterally placed, especially in larger, broadly pyriform conidia. Conidiophores are occasionally branched, often showing an irregular tear of the proximal periclinal wall, and conidia sometimes carried away a more or less short piece of conidiophore once released, a feature mentioned by Baker & Morgan-Jones (2003) and not related with rhexolytic secession.

Sporidesmiella sinensis W.P. Wu, in Wu & Zhuang, Fungal Diversity Research Series 15: 176, 2005. FIGS. 21–22

Colonies effuse, brown, hairy. Conidiophores cylindrical, straight or flexuous, smooth, brown, paler toward the apex, up to 131 µm long, 3–5 µm wide, 6–10 µm wide at base, with up to 7 inconspicuous annellidic percurrent proliferations. Conidia clavate, 3-distoseptate, rarely 2 or 4, cell lumina reduced, pale olivaceous to pale brown, 18–26 × 5–7.5 µm; apex rounded, basal cell slightly darker, truncate, 4 µm wide at the base.

SPECIMEN EXAMINED: Florida, Collier Co., Naples, on dead liana stems, XI.24.2007, coll. G. Delgado (BPI 880520A).

Sporidesmiella sinensis was recently described from dead twigs in China (Wu & Zhuang 2005). The original discussion did not include *S. oraniopsis* Yanna et al., a morphologically similar species having also percurrent proliferating conidiophores and 3-distoseptate, pale-colored, rounded at the apex, truncate at the base, clavate conidia (Yanna et al. 2001). *Sporidesmiella sinensis*, however, has smaller (24–26 × 7.5–9 µm), also cuneiform, pale olivaceous to olivaceous brown conidia and inconspicuous, 4–8 annellidic proliferations, while *S. oraniopsis* has pale brown, larger conidia (28–40 x 8–10 µm), rarely with 4 to 5 distosepta, and conspicuous, up to 18 percurrent proliferations at the apex. The Florida specimen agrees fairly well with the holotype description of *S. sinensis*, but conidia are narrower and rarely 2 or 4-distoseptate.

Triposporium verruculosum R.F. Castañeda, Gené & Guarro, Mycotaxon 59: 207, 1996. FIG. 20

Colonies hairy, effuse. Conidiophores cylindrical, straight or slightly flexuous, smooth, brown, up to 100 µm long, 4–6 µm wide, basal cells dark brown, 8–10

µm wide. Conidiogenous cells monoblastic, integrated, terminal, cylindrical, occasionally with 1–2 doliiform percurrent proliferations, slightly attenuated and truncate at the apex. Conidia stauriform, composed of a brown, obconical or cylindrical basal cell, 4–8 × 4.5–6 µm, a dark brown, verrucose suprabasal cell, 4–6 x 5–8 µm, and 2–4 divergent, verruculose, brown arms, 3–5-septate, 14–28 µm long, 7–9 µm wide at base, paler toward the apex and frequently ending in a rounded drop of mucilage, 3.5–5 µm diam.

Specimen examined: Florida, Collier Co., Naples, on rachides of dead leaves of *Sabal palmetto*, XI.23.2007, coll. G. Delgado (BPI 880518B).

Triposporium verruculosum morphologically resembles *T. elegans* Corda the type species of the genus (Ellis 1971, Wu & Zhuang 2005), but differs in having verruculose, smaller conidial arms. The fungus was originally described on rotten fallen leaf of *Laurus* sp. from Canary Islands (Castañeda et al. 1996a). A second specimen collected on dead leaf of *Quercus ilex* L. from New Zealand is deposited in PDD (NZFUNGI 2010). The Florida collection has shorter conidiophores compared with the holotype (120–260 µm long).

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